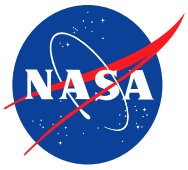
National Aeronautics and
Space Administration




# Innovative Partnerships Program

*Providing leveraged technology for Mission Directorates, Programs and Projects through investments and technology partnerships with Industry, Academia, Government Agencies and National Laboratories.*

# Partnership Seed Fund Call for Proposals – 2006

August 04, 2006

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# Partnership Seed Fund
# Call for Proposals

## Background

The Innovative Partnerships Program (IPP) provides leveraged technology for Mission Directorates, Programs and Projects through investments and technology partnerships with industry, academia, government agencies and national laboratories. As one of NASA's Mission Support Offices, IPP supports all four Mission Directorates and has program offices at each of the ten NASA Centers.

The IPP Partnership Seed Fund has been established as a new initiative to enhance NASA's ability to meet mission technology goals by providing seed funding to address barriers and initiate cost-shared, joint-development partnerships. The IPP Seed Fund will be used to provide "bridge" funding to enable larger partnerships and development efforts to occur and will encourage, to the maximum extent possible, the leveraging of funding, resources and expertise from non-NASA partners, NASA Programs and Projects and NASA Centers.

Partnership goals include providing for an increased range of technology solutions, a broadened technology portfolio, improved cost avoidance, accelerated development and maturation of technologies, and a larger pool of qualified commercial providers.

## Scope

This internal Call to NASA is soliciting proposals for cost-shared partnerships with industry, academia, research institutions, national laboratories and other government agencies for joint development of technology that is of primary interest to NASA. This Call is being distributed through the four Mission Directorates as well as through the Center IPP offices (IPPO). Responses to this call must be from NASA personnel and proposals submitted directly from parties external to NASA will not be accepted.

The total budget for the Seed Fund in FY06 is $6.25M, and the IPPO at Headquarters anticipates awarding approximately 40 projects; therefore, each NASA Center shall submit no more than eight (8) proposals to the Headquarters IPPO in response to this Call. Proposal submission will be conducted through the IPPOs at each Center, and the Center IPPOs will have the final approval over which proposals are submitted from that Center. Proposed projects will be competitively selected by the IPPO at Headquarters in coordination with representatives from each of the four Mission Directorates based on the criteria identified within this Call.

The project awards will range in value from $50K to $250K (IPP Seed Fund portion); however, proposals exceeding $250K will be allowed on an exception basis only with approval from the

IPPO Director. Approval shall be obtained via the Center IPPO. Actual total project value will vary based on the full amount of leveraging available from all of the participants. Projects will typically be awarded as one year or less in duration, but may be longer with appropriate justification. The funds for winning proposals will be transferred to the IPP offices at those Centers for award and management of the projects.

Proposals submitted in response to this Internal Call will include provisions for three primary participants for each project to be funded as follows:

1. Partnership Manager (PM) – The PM will be a representative from the Center IPPO and will have primary responsibility for creating the partnership development, intellectual property and business aspects of the proposal. The PM will also assume the project management responsibilities for selected projects and will be responsible for all reporting requirements established by the IPP.
2. Co-Principal Investigator (Co-PI) – The NASA Co-PI will be a representative from the Program or Project office at the Center or a designated PI from within the technical organizations at that Center and will be responsible, in conjunction with the External Co-PI, for developing the technical content for the proposals and performing the technology development activities under the partnership..
3. External Co-PI – The External Co-PI from the non-NASA Partner will be responsible, in conjunction with the NASA Co-PI, for developing the technical content for the proposals and performing the technology development activities under the partnership.

## Cost-Share Requirements

The IPP Seed Fund seeks to fund highly leveraged partnerships where the costs, risks, benefits and outcomes are shared by all parties involved. In order to meet this goal, the following guidelines have been established for contributions by each party:

Non-NASA Partner – Proposed projects must include one or more non-NASA partner(s) that is willing to provide cost-sharing at a level equal to or greater than the IPP Seed Fund dollars provided to the project. However, special situations may arise in which IPP will allow a partner's contribution to be less than the IPP Seed Fund contribution. Acceptable cost-sharing from the partner includes actual dollars applied directly to the project, in-kind considerations such as workforce labor and the use of unique and dedicated facilities and testbeds.

NASA Program or Project – Contributions from the Program, Project and/or Center involved in performance of the partnership is also required. These NASA contributions may be in the form of direct funding toward the partnership, funded FTEs or the use of unique and dedicated facilities and testbeds in support of the partnership.

Innovative Partnerships Program – In addition to the Seed Funding provided directly to the partnership, the IPP also contributes to the partnership by covering all costs associated with the IPP PM function using the Center's existing IPP budget in lieu of charging these costs under the project.

## Innovative Partnership Program Product Area Alignment

Proposals submitted under this call must align with one or more of the following IPP product areas and strategic business practices:

Emergent Technologies:

- Partnerships with universities, research institutes, industry and other government agencies that advance low Technology Readiness Level (TRL) technology that is of strategic importance to future NASA missions.
- Cost-shared projects that leverage existing research activities with universities and/or education programs such as Space Grant, summer faculty, internships, etc.

Joint Technology Partnerships:

- Partnerships with industry for Dual Use technology development that focus on mid-range TRLs (from 4 to 6) to address technology gaps and needs identified by the Mission Directorates, Programs and Projects.
- Partnerships that facilitate the transition of Small Business Innovation Research (SBIR) Program and Small Business Technology Transfer (STTR) Program Phase I and Phase II development contracts into Phase III activities for further development, maturation and insertion into NASA missions.
- Cost-shared projects that address barriers and remove obstacles to technology development efforts that could then lead to larger development partnerships and projects that would be of greater significance and value to the NASA.

Intellectual Property Management:

- Partnerships that support the strategic use of NASA intellectual property such as licensing to develop a commercial product, process or capability that is determined to be of direct benefit to NASA.

Non-Traditional Partnerships:

- Public/private partnerships with non-traditional partners that are leaders in the areas of science, engineering and innovative technology. Partnerships extend beyond technology development but still bring additional value to NASA Program, Projects and Centers.
- Partnerships may be complex, cross-agency and broader based, and will not follow traditional procurement paths.

## Mission Directorate Alignment

Proposed partnerships **must show relevance and value to NASA Mission Directorates**. The list of Technology Focus Areas provided in "Attachment A" has been developed by each of the four Mission Directorates and is provided as guidance for the identification and selection of potential projects. Proposers should contact appropriate directorate program/project personnel for a more definitive statement of needs and potential partnership opportunities. Proposals that address cross-cutting technology that supports the needs of more than one Mission Directorate are encouraged as well as proposals that include elements of collaboration between Centers.

## Partnership Objectives and Outcomes

Proposals must define clear objectives and anticipated outcomes for the proposed partnerships and demonstrate how successful projects will transition to the next phase of the technology development life-cycle or funding opportunity in support of NASA missions. While projects may be eligible for submission under subsequent Seed Fund calls in FY07 and beyond, proposals submitted under this FY06 call shall be for discreet projects with tangible and relevant results expected at the completion of the proposed project. The relevance and perceived value of the proposed outcomes will be significant factors in the evaluation and selection of proposals.

## Partnership Mechanisms

Awards made to external entities through this Internal Call will be in the form of Space Act Agreements, Cooperative Agreements, Cost-Sharing Contracts, Cooperative Research and Development Agreements (CRADAs), and change orders against similar existing contracts and agreements. The PM, in conjunction with NASA Contracting Officers at the individual NASA Centers, will be responsible for determining the appropriate award instrument for the selections resulting from this solicitation. Winning proposal teams at the Centers are responsible for the selection of external partners, negotiation and execution of award instrument, and management of funds.

Cooperative Agreements will be subject to the NASA Grants and Cooperative Agreement Handbook (found at http://ec.msfc.nasa.gov/hq/grcover.htm). Contract awards will be subject to the Federal Acquisition Regulations (FAR) and the NASA FAR Supplement (see http://ec.msfc.nasa.gov/hq/library/v-reg.htm). Space Act Agreements will be subject to the NASA Space Act Agreements Manual NAII 1050-1 (see http://nodis3.gsfc.nasa.gov/1050-1.html).

## Proposal Criteria

The following criteria will be used to evaluate the IPP Seed Fund proposals:

1. **Relevance and Value to NASA –** Proposal's relevance and value to current and future NASA missions, alignment with IPP objectives, linkage to Mission Directorate Technology Focus Areas.

2. **Scientific/Technical Merit and Feasibility** – Overall scientific and technical merit of the proposal.

3. **Quality of Cost-Share and Leveraging of Resources** – Level and quality of the cost-share and resources contributed by the non-NASA partner and the degree to which the proposed project leverages other NASA funding.

4. **Capability and Strength of Partnership Team** – Proposed team's capabilities, related experience, expertise, special facilities and equipment and techniques which are integral to achieving the proposal objectives; and the clarity of roles, responsibilities and interrelationship between the individual team members.

5. **Budget/Schedule** – Realism of the proposed schedule and level of funding requested relative to the anticipated goals, objectives and outcomes of the partnership; and the overall return on investment for NASA.

**Proposal Format and Submission**

Proposals are limited to five pages each, (not including resumes, letters of intent, endorsement or reference). Proposals that exceed the number of pages will not be considered. Text shall be single-spaced, using 12 point Times New Roman font, and all pages shall be numbered in the bottom-center of the footer.

Proposals shall contain the following information:

**1. Project Title:**

**2. PM and Co-PI(s):** Center IPP office, Program/Project representative, non-NASA partner principal participants

**3. IPP Product Area Supported –** Emergent Technologies, Joint Technology Partnerships, Intellectual Property Management or Non-traditional Partnerships

**4. Mission Directorate(s) Supported** – ARMD, ESMD, SMD and SOMD

**5. Scope or Abstract –** Identify the need or problem that is being addressed and summarize the overall approach to be undertaken and the value and benefits to NASA.

**6. Technical Approach –** Identify technical approach, current state-of-the-art work related to what's being proposed, identify related prior or current work being done in this area, and expertise and capabilities of technical team (attach short resumes). Include a schedule and key milestones for proposed work.

**7. Approach to Partnering –** Identify the partner(s) and their proposed contributions to the project (both financially and technically), identify NASA's contributions to the project, roles and responsibilities of each party, the proposed partnership mechanism and potential commercialization opportunities.

**8. Benefit to NASA –** Identify alignment to IPP elements and Mission Directorate technology focus areas, identify future value to NASA (return on investment, cost savings/cost avoidance, increased safety, reduced development time, etc.), identify next steps (exit strategy) for the technology or partnership.

**9. Budget –** Provide a detailed full cost budget to include:

- Funding requested from IPP
- Funding provided by the NASA (other than IPP)
- Funding provided by the external partner
- Total Budget
- FTE & WYE labor for NASA and the external partner
- Procurements and Other Direct Costs

**10. Letter of intent from an authorized official of the proposed external partner(s)**

**11. Concurrence signature from a cognizant NASA Program Office Representative –** The concurring official must have authority to commit program/project resources in support of the proposal. If unsure of appropriate Program/Project Office Representative, contact the appropriate Field Center IPP point of contact identified below.

All proposals submitted in response to this Internal Call must be received by the HQ IPPO before midnight on **September 15, 2006** and shall be submitted through the IPPOs at each of the respective Centers. Proposals shall be submitted electronically to Dr. Minoo Dastoor, IPP Chief Technologist. Each proposal shall be in a single pdf file and shall use the following file nomenclature: Center_ProjectTitle.pdf. If proprietary information precludes submittal of a proposal via email, then a computer CD containing the proposal file(s) may be mailed to Dr. Dastoor at NASA Headquarters, Mail Suite: 6J79, 300 E Street, SW, Washington, DC 20546-0001.

A listing of Headquarters and Center IPP points of contact is provided below.

## IPP Points of Contact Listing

**Headquarters IPP Office:**

Minoo Dastoor
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Darryl Mitchell
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Email: Darryl.R.Mitchell@nasa.gov

**Center IPP Offices:**

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**Dryden Flight Research Center:**
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**Glenn Research Center:**
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**Goddard Space Flight Center:**
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**Jet Propulsion Laboratory:**
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**Johnson Space Center:**
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**Kennedy Space Center:**
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Email: Rosemary.R.Baize@nasa.gov

**Langley Research Center:**
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**Marshall Space Flight Center:**
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Email: Vernotto.C.Mcmillan@nasa.gov

**Stennis Space Center:**
John Bailey
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# Attachment A

# Mission Directorate Technology Focus Areas

**Aeronautics Research Mission Directorate:**

**Fundamental Aeronautics**

Subsonic: Fixed Wing – Research emphasis is on developing technologies for improving performance (reduced fuel burn), reducing noise, and reducing emissions for subsonic aircraft. A major product will be fast and effective physics based multi-disciplinary analysis and design tools with quantified levels of uncertainty that enable virtual expeditions through the design space for conventional and unconventional vehicles.

Subsonic: Rotary Wing - Physics-based multi-disciplinary analysis and design tools and technologies that enable increased civil competitiveness of rotorcraft, including improved efficiency, productivity, and environmental acceptance.

Supersonics – Tools and technology for the supersonic flight regime including: highly efficient airframes and engines, light weight and durable material and structures for high temperature, sonic boom modeling, airport noise, high altitude emissions, aeroservoelasticity, entry/descent/landing in planetary atmospheres, and integrated systems for multidisciplinary design and analysis.

Hypersonics – Development of physics-based multi-disciplinary analysis and design optimization predictive capabilities, incorporating uncertainties. Highly Reliable Reusable Launch Systems (HRRLS) and High Mass Mars Entry Systems (HMMES) have been chosen to focus technology and methods development efforts.

**Aviation Safety Program**

Integrated Vehicle Health Management – Airframe health management; propulsion health management; environmental health management; system architectural framework; validation and predictive capability assessment

Integrated Intelligent Flight Deck – Tailored flexible operator-automation management; adaptive displays and interaction; decision associate technology; intelligent information management

Integrated Resilient Aircraft Control – Resilient flight control; resilient propulsion control; resilient airframe control; resilient vehicle mission management; safety-critical systems V&V

Aircraft Aging & Durability – Detection and characterization of aging related hazards; prediction of life, strength and durability of systems with degradation; Mitigation of aging related hazards

**Airspace Systems**

NGATS: Airspace – Adaptive air/ground automation concepts & technologies; airspace modeling and simulation; systems analysis and integration; experimental and validation

NGATS: Airportal – Adaptive air/ground automation concepts & technologies; airportal modeling and simulation; system analysis and integration; experimentation and validation

**Aeronautics Test Program**
Test Technology Development – Aeronautics test technology for wind tunnels and aeropropulsion test facilities that improves data quality, facility productivity, facility cost, test capability, and integration with computational.

University Research - Provide experience to graduate students in the use of large aeronautics test facilities while carrying out valuable aeronautics research.

**Exploration Systems Mission Directorate:**

Structures – Lightweight cryotanks, inflatable space structures;
Protection – Ablative, human-related TPS, lightweight radiation protection, dust and contaminant mitigation;
Propulsion – LOX/Methane propulsion system for CEV, 5-20 klbf thrust deep throttleable engine for LSAM, non-toxic RCS thrusters, expendable SSMEs;
Power – Fuel cells, lithium-ion batteries, non-toxic Auxiliary Power Unit for CEV;
Thermal Control – Heat rejection for surface systems;
Avionics & Software – Radiation hardened & low temperature electronics, integrated system health management, spacecraft autonomy, automated rendezvous and docking, autonomous precision landing, reliable software;
Environmental Control & Life Support – Atmospheric management, environmental monitoring & control, advanced air & water recovery systems;
Crew Support & Accommodations – EVA suit, crew health care systems, habitability systems;
Mechanisms – Low temperature mechanisms;
In-Situ Resource Utilization – Regolith excavation & material handling, oxygen production from regolith, polar volatile collection & separation;
Analysis & Integration – Tool development for architecture & mission analysis, technology investment portfolio assessments;
Operations – Supportability, human-system interaction, surface handling & operations equipment, surface mobility.

**Science Mission Directorate**

New Remote Sensing Technologies – to better see, detect, and measure the Earth, the sun, the solar system, and the universe
Large, Lower Cost, Lightweight Mirrors and Space-Deployable Structures – for the next generation of large telescopes and antennas
Novel Platforms – including power and propulsion technologies, that can take instruments to new vantage points
Intelligent Distributed Systems – that enable advanced communications, efficient data processing and transfer, and autonomous operations of land- and space-based assets

Information Synthesis – to derive useful knowledge from extremely large data sets through visualization, advanced simulations, analysis, and seamlessly linked models

**Space Operations Mission Directorate**

Space Communications – Optical communication; spacecraft RF technology; antenna array transmit technology; programmable communication system
Space Transportation – Automated optical tracking and identification; transportation test requirements and instrumentation; automated collection and transfer of data, integrated system health monitoring

** Technologies that reduce costs for space and ground operations and provide for miniaturization of hardware are of primary interest to SOMD.